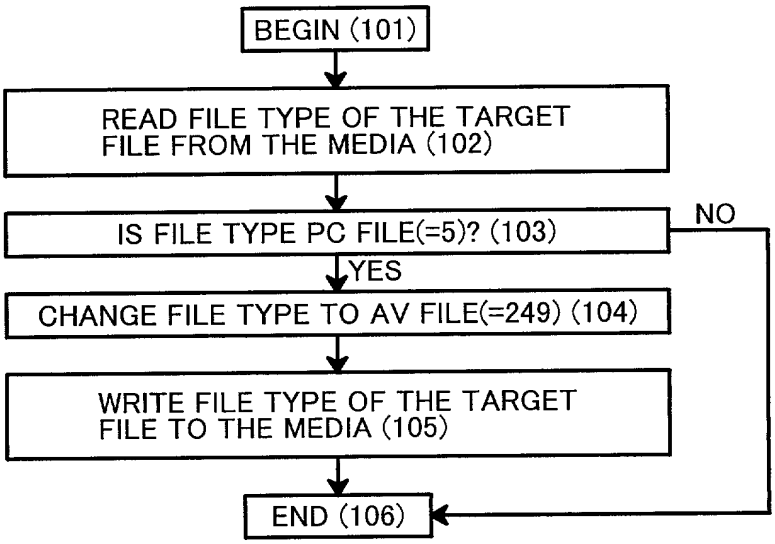
FIG.1



US 2005/0144635 A1

FIG.2

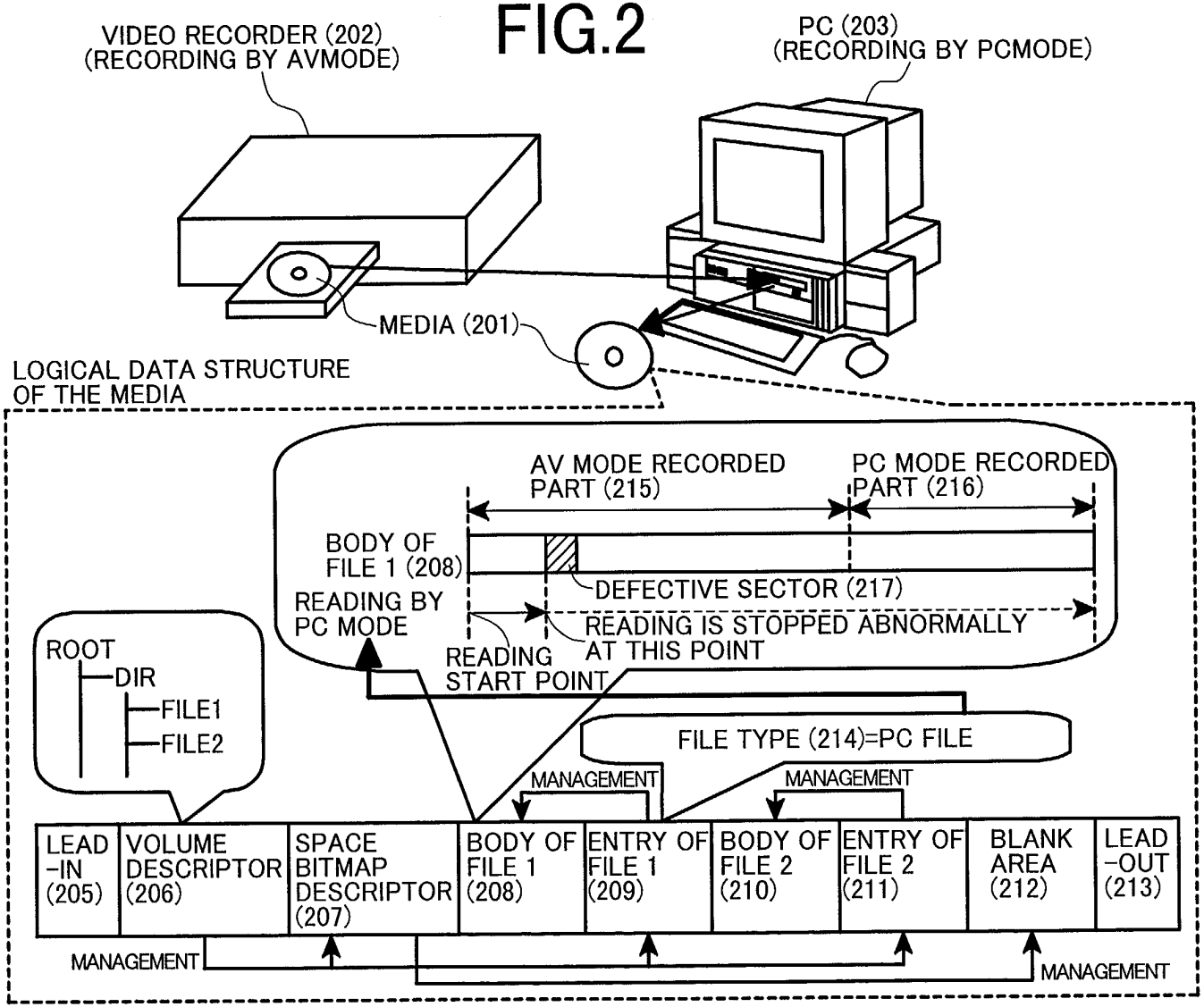

VIDEO RECORDER (202)
(RECORDING BY AVMODE)
PC (203)
(RECORDING BY PCMODE)
MEDIA (201)
LOGICAL DATA STRUCTURE
OF THE MEDIA
AV MODE RECORDED
PART (215)
PC MODE RECORDED
PART (216)
BODY OF
FILE 1 (208)
DEFECTIVE SECTOR (217)
READING BY
PC MODE
READING IS STOPPED ABNORMALLY
AT THIS POINT
READING
START POINT
ROOT
DIR
FILE1
FILE2
FILE TYPE (214)=PC FILE
MANAGEMENT
MANAGEMENT
LEAD
-IN
(205)
VOLUME
DESCRIPTOR
(206)
SPACE
BITMAP
DESCRIPTOR
(207)
BODY OF
FILE 1
(208)
ENTRY OF
FILE 1
(209)
BODY OF
FILE 2
(210)
ENTRY OF
FILE 2
(211)
BLANK
AREA
(212)
LEAD
-OUT
(213)
MANAGEMENT
MANAGEMENT

FIG.3

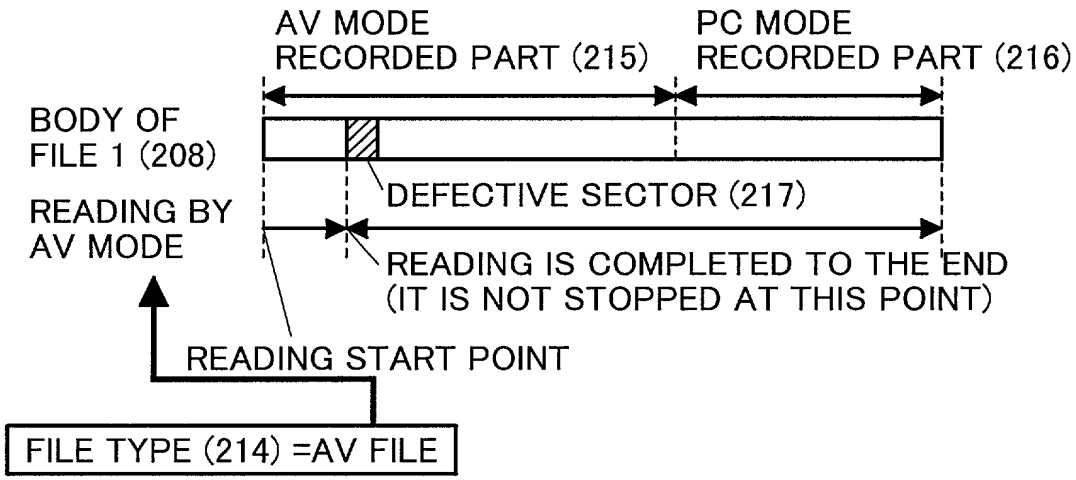

AV MODE
RECORDED PART (215)
PC MODE
RECORDED PART (216)
BODY OF
FILE 1 (208)
DEFECTIVE SECTOR (217)
READING BY
AV MODE
READING IS COMPLETED TO THE END
(IT IS NOT STOPPED AT THIS POINT)
READING START POINT
FILE TYPE (214) =AV FILE

FIG.4

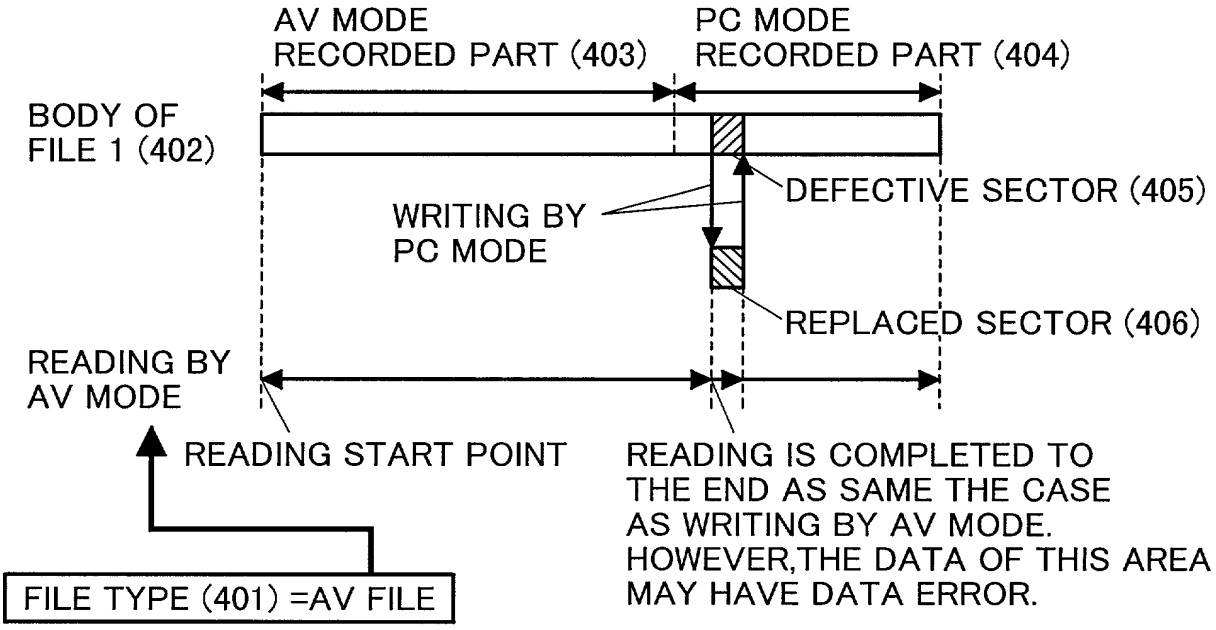
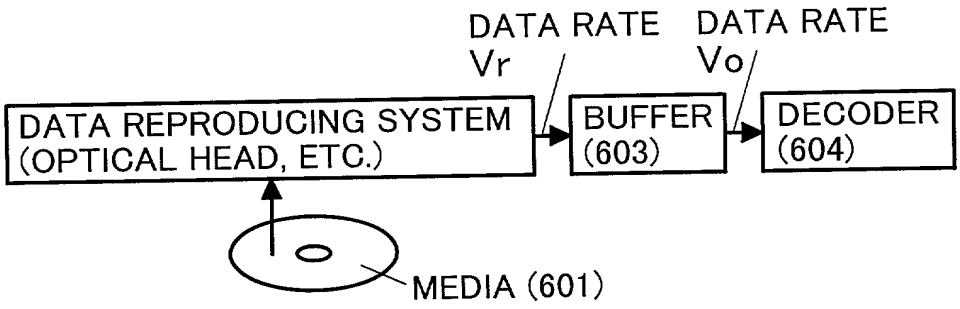

AV MODE
RECORDED PART (403)
PC MODE
RECORDED PART (404)
BODY OF
FILE 1 (402)
DEFECTIVE SECTOR (405)
WRITING BY
PC MODE
REPLACED SECTOR (406)
READING BY
AV MODE
READING START POINT
READING IS COMPLETED TO
THE END AS SAME THE CASE
AS WRITING BY AV MODE.
HOWEVER,THE DATA OF THIS AREA
MAY HAVE DATA ERROR.
FILE TYPE (401) =AV FILE

FIG.5

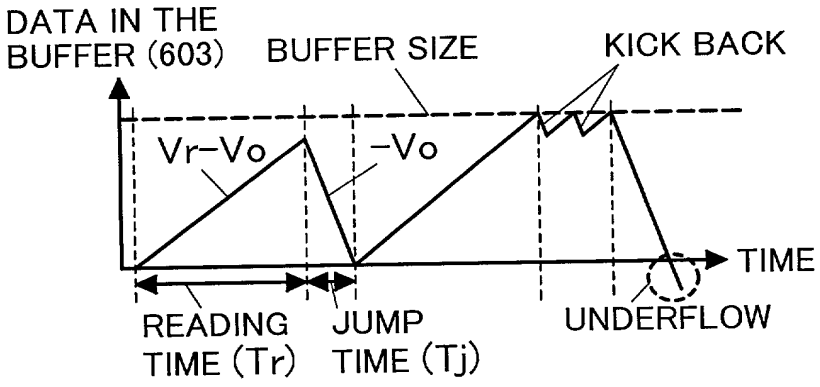
		PC FILE	AV FILE
FILE ENTRY (209)	FILE THPE (214)	5	249
	NON-RELOCATABLE FLAG (501)	0 (RELOCATABLE)	1 (NON-RELOCATABLE)
FILE BODY (208)	ECC BLOCK STATE (502)	OTHER FILES CAN SHARE THIS ECC BLOCK	OTHER FILES MUST NOT SHARE THIS ECC BLOCK
FILE TAIL (503)	ECC BLOCK STUFFING (504)	NOT NEEDED	MANDATED

FIG.6A



AN EXAMPLE OF PLAYER

FIG.6B



AN EXAMPLE OF BUFFER BEHAVIOR

FIG.7

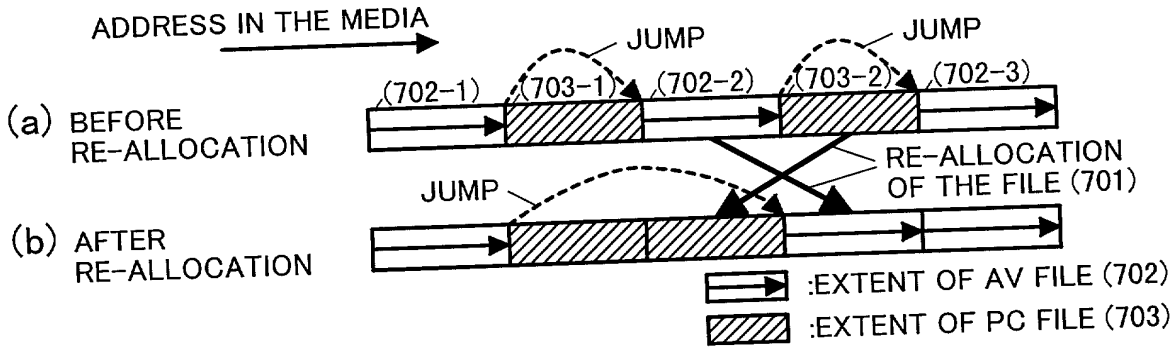

ADDRESS IN THE MEDIA
JUMP
JUMP
(702-1)
(703-1)
(702-2)
(703-2)
(702-3)
(a) BEFORE RE-ALLOCATION
RE-ALLOCATION OF THE FILE (701)
JUMP
(b) AFTER RE-ALLOCATION
:EXTENT OF AV FILE (702)
:EXTENT OF PC FILE (703)

FIG.8

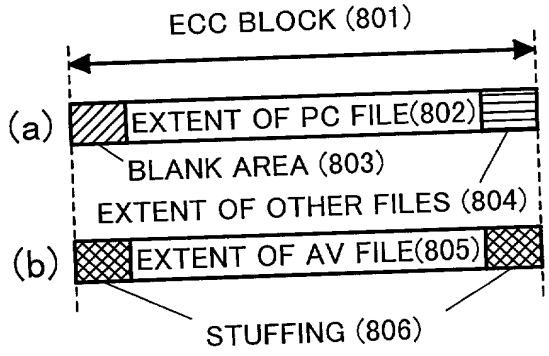

ECC BLOCK (801)
(a)
EXTENT OF PC FILE(802)
BLANK AREA (803)
EXTENT OF OTHER FILES (804)
(b)
EXTENT OF AV FILE(805)
STUFFING (806)

FIG.9

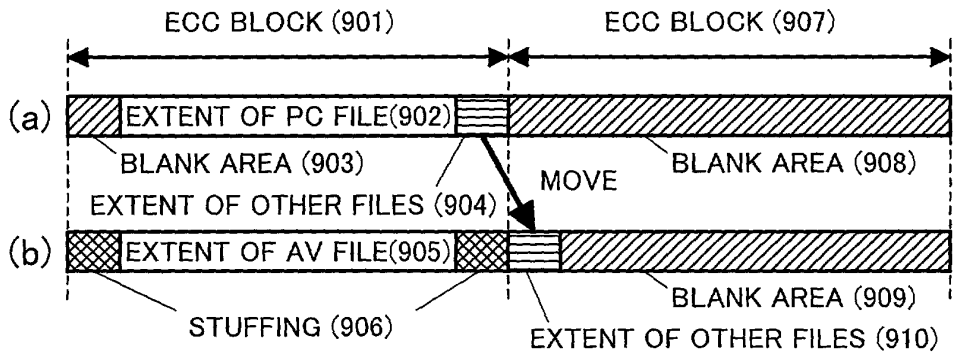

ECC BLOCK (901)
ECC BLOCK (907)
(a)
EXTENT OF PC FILE(902)
BLANK AREA (903)
EXTENT OF OTHER FILES (904)
MOVE
BLANK AREA (908)
(b)
EXTENT OF AV FILE(905)
STUFFING (906)
BLANK AREA (909)
EXTENT OF OTHER FILES (910)

FIG.10

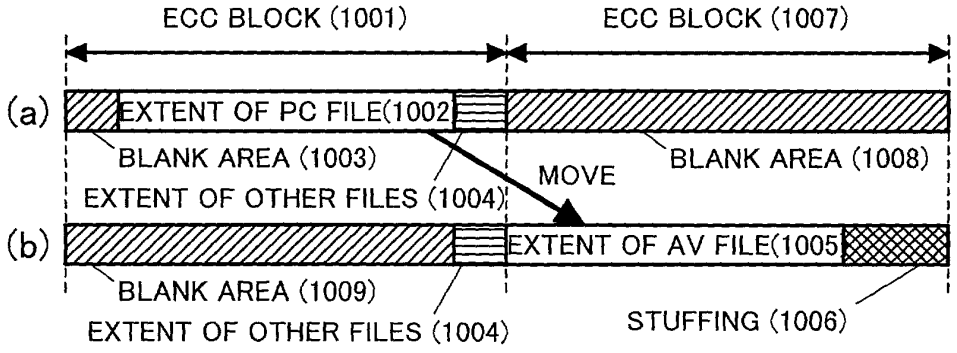
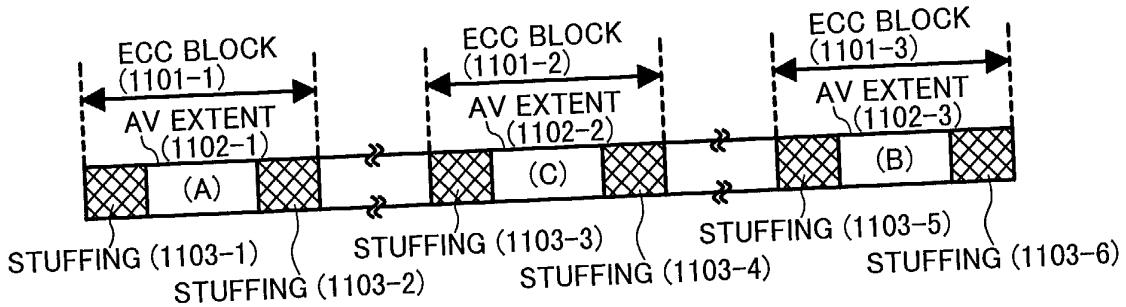

ECC BLOCK (1001)
ECC BLOCK (1007)
(a)
EXTENT OF PC FILE(1002
BLANK AREA (1003)
EXTENT OF OTHER FILES (1004)
MOVE
BLANK AREA (1008)
(b)
EXTENT OF AV FILE(1005
BLANK AREA (1009)
EXTENT OF OTHER FILES (1004)
STUFFING (1006)

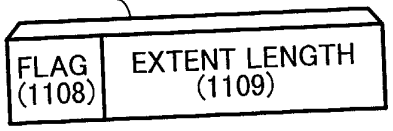
FIG.11



ALLOCATION INFORMATION (1104)

FILE BODY (208)	(A) ALLOCATION DESCRIPTOR OF AV EXTENT (1105-1)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-1) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-1)
	(B) ALLOCATION DESCRIPTOR OF AV EXTENT (1105-2)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-2) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-2)
	(C) ALLOCATION DESCRIPTOR OF AV EXTENT (1105-3)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-3) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-3)
FILE TAIL (503)	ALLOCATION DESCRIPTOR STUFFING (1105-4)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-4) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-4)
	ALLOCATION DESCRIPTOR STUFFING (1105-5)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-5) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-5)
	ALLOCATION DESCRIPTOR STUFFING (1105-6)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-6) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-6)
	ALLOCATION DESCRIPTOR STUFFING (1105-7)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-7) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-7)
	ALLOCATION DESCRIPTOR STUFFING (1105-8)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-8) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-8)
	ALLOCATION DESCRIPTOR STUFFING (1105-9)	FLAG+EXTENT LENGTH (NUMBER OF BYTES) (1106-9) / EXTENT POSITION (LOGICAL SECTOR NUMBER (1107-9)

FLAG+EXTENT LENGTH (1106)



DEFINITION OF FLAG (1108)
- 00 : EXTENT IS ALLOCATED AND RECORDED
- 01 : EXTENT IS ALLOCATED BUT NOT RECORDED
- 10 : EXTENT IS NOT ALLOCATED AND NOT RECORDED
- 11 : TO BE CONTINUED TO NEXT ALLOCATION INFORMATION

FIG.12

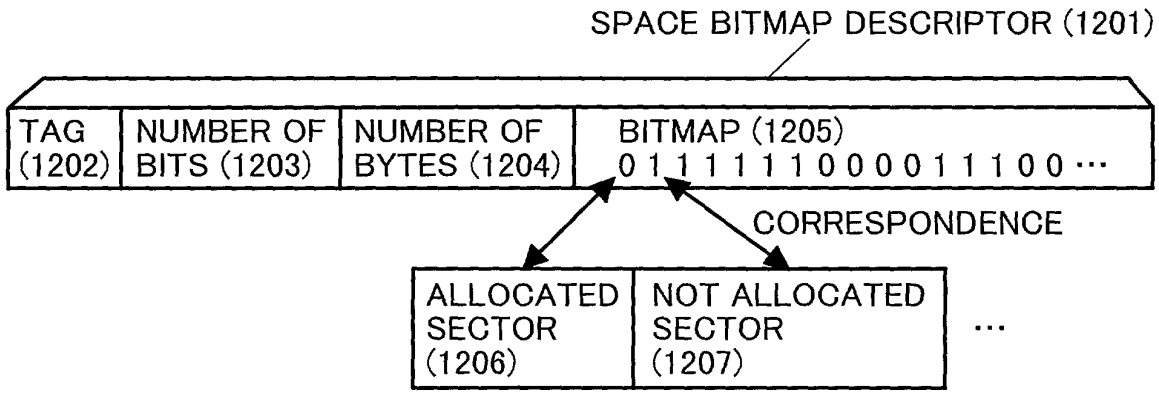

SPACE BITMAP DESCRIPTOR (1201)
TAG (1202)
NUMBER OF BITS (1203)
NUMBER OF BYTES (1204)
BITMAP (1205)
0 1 1 1 1 1 1 0 0 0 0 1 1 1 0 0 ···
CORRESPONDENCE
ALLOCATED SECTOR (1206)
NOT ALLOCATED SECTOR (1207)
···

FIG.13

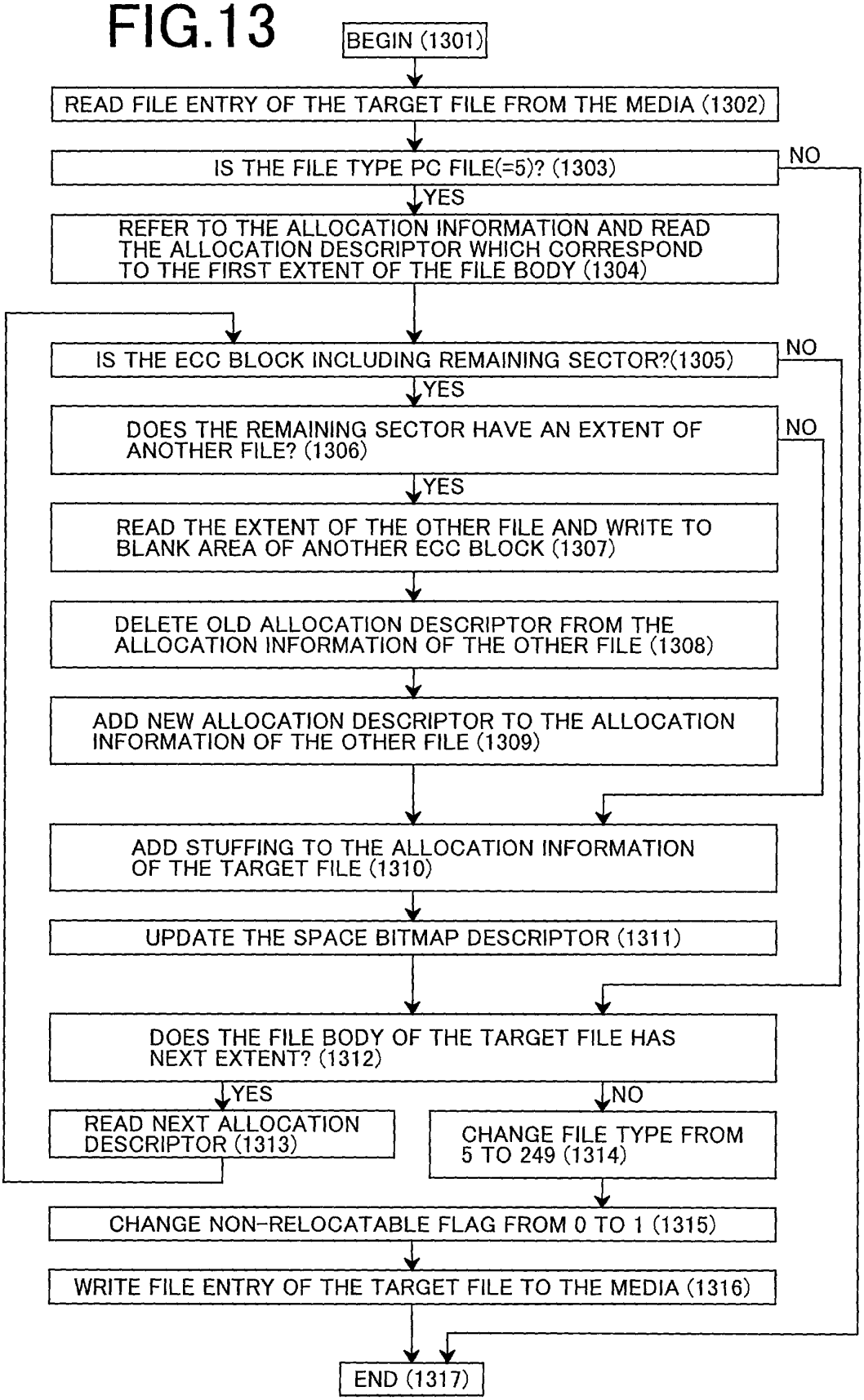

BEGIN (1301)
READ FILE ENTRY OF THE TARGET FILE FROM THE MEDIA (1302)
IS THE FILE TYPE PC FILE(=5)? (1303)
NO
YES
REFER TO THE ALLOCATION INFORMATION AND READ THE ALLOCATION DESCRIPTOR WHICH CORRESPOND TO THE FIRST EXTENT OF THE FILE BODY (1304)
IS THE ECC BLOCK INCLUDING REMAINING SECTOR?(1305)
NO
YES
DOES THE REMAINING SECTOR HAVE AN EXTENT OF ANOTHER FILE? (1306)
NO
YES
READ THE EXTENT OF THE OTHER FILE AND WRITE TO BLANK AREA OF ANOTHER ECC BLOCK (1307)
DELETE OLD ALLOCATION DESCRIPTOR FROM THE ALLOCATION INFORMATION OF THE OTHER FILE (1308)
ADD NEW ALLOCATION DESCRIPTOR TO THE ALLOCATION INFORMATION OF THE OTHER FILE (1309)
ADD STUFFING TO THE ALLOCATION INFORMATION OF THE TARGET FILE (1310)
UPDATE THE SPACE BITMAP DESCRIPTOR (1311)
DOES THE FILE BODY OF THE TARGET FILE HAS NEXT EXTENT? (1312)
YES
NO
READ NEXT ALLOCATION DESCRIPTOR (1313)
CHANGE FILE TYPE FROM 5 TO 249 (1314)
CHANGE NON-RELOCATABLE FLAG FROM 0 TO 1 (1315)
WRITE FILE ENTRY OF THE TARGET FILE TO THE MEDIA (1316)
END (1317)

FIG.14

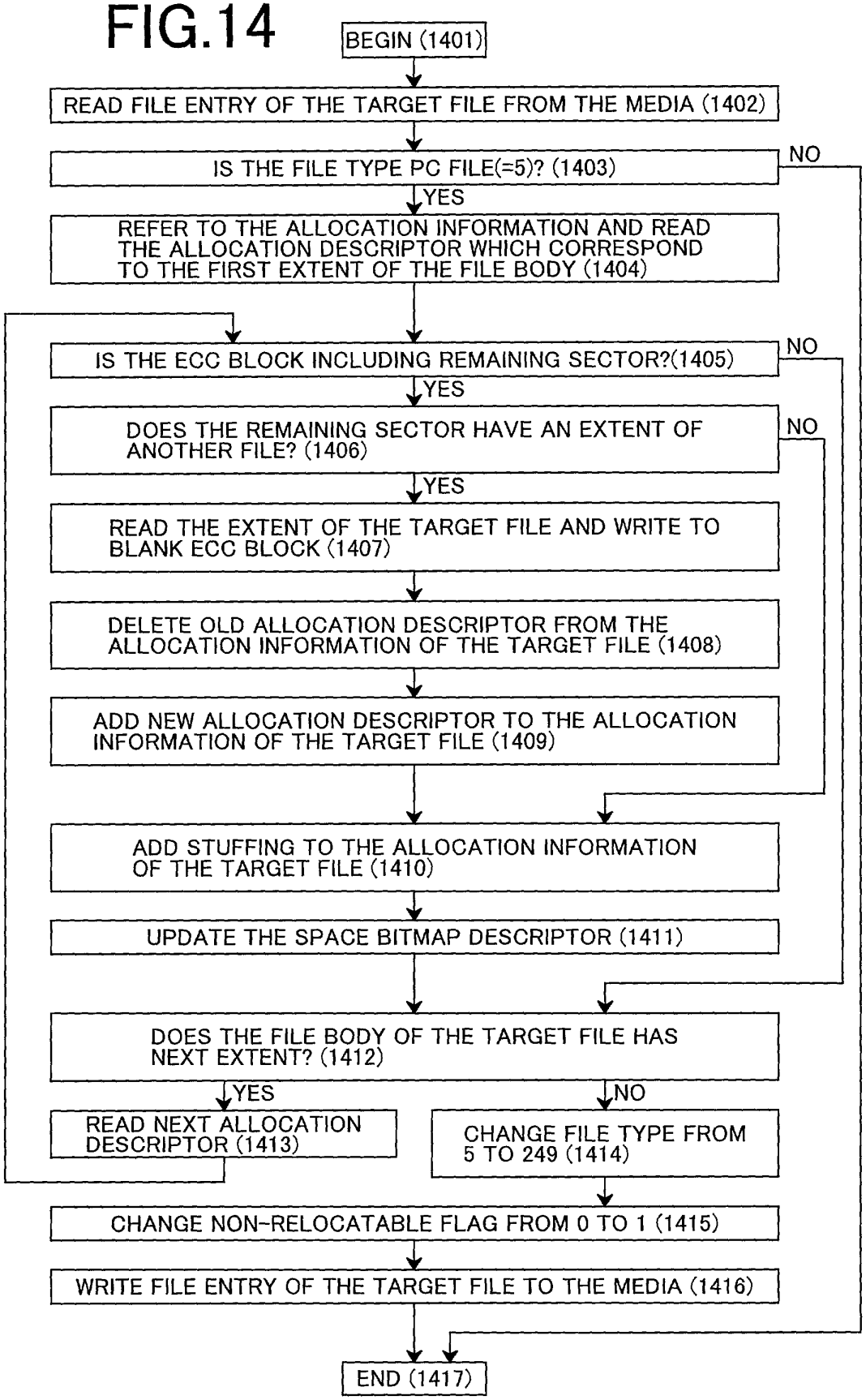

BEGIN (1401)
READ FILE ENTRY OF THE TARGET FILE FROM THE MEDIA (1402)
IS THE FILE TYPE PC FILE(=5)? (1403)
NO
YES
REFER TO THE ALLOCATION INFORMATION AND READ THE ALLOCATION DESCRIPTOR WHICH CORRESPOND TO THE FIRST EXTENT OF THE FILE BODY (1404)
IS THE ECC BLOCK INCLUDING REMAINING SECTOR?(1405)
NO
YES
DOES THE REMAINING SECTOR HAVE AN EXTENT OF ANOTHER FILE? (1406)
NO
YES
READ THE EXTENT OF THE TARGET FILE AND WRITE TO BLANK ECC BLOCK (1407)
DELETE OLD ALLOCATION DESCRIPTOR FROM THE ALLOCATION INFORMATION OF THE TARGET FILE (1408)
ADD NEW ALLOCATION DESCRIPTOR TO THE ALLOCATION INFORMATION OF THE TARGET FILE (1409)
ADD STUFFING TO THE ALLOCATION INFORMATION OF THE TARGET FILE (1410)
UPDATE THE SPACE BITMAP DESCRIPTOR (1411)
DOES THE FILE BODY OF THE TARGET FILE HAS NEXT EXTENT? (1412)
YES
NO
READ NEXT ALLOCATION DESCRIPTOR (1413)
CHANGE FILE TYPE FROM 5 TO 249 (1414)
CHANGE NON-RELOCATABLE FLAG FROM 0 TO 1 (1415)
WRITE FILE ENTRY OF THE TARGET FILE TO THE MEDIA (1416)
END (1417)

FIG.15

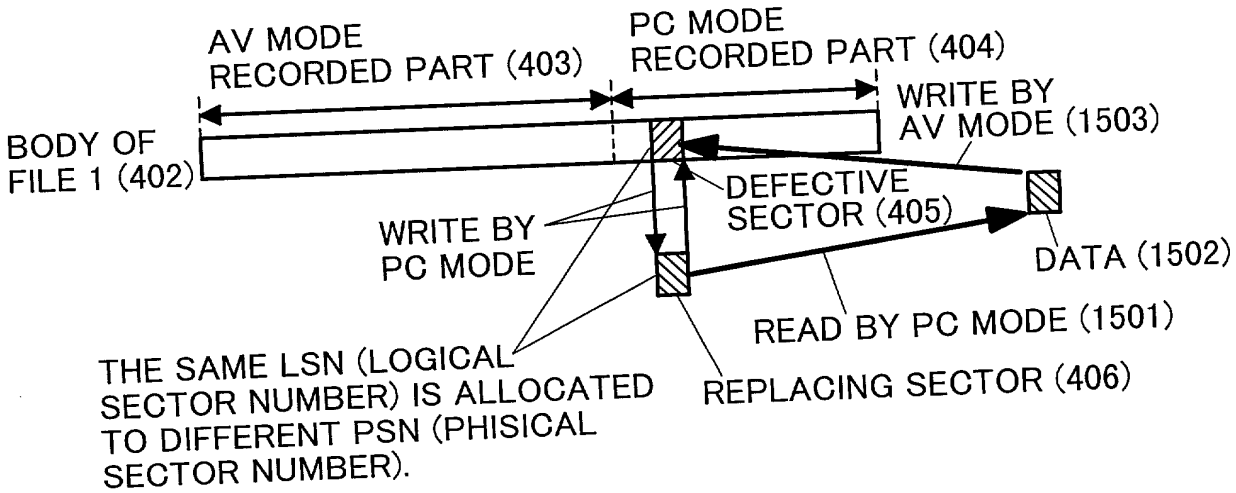

AV MODE
RECORDED PART (403)
PC MODE
RECORDED PART (404)
WRITE BY
AV MODE (1503)
BODY OF
FILE 1 (402)
DEFECTIVE
SECTOR (405)
WRITE BY
PC MODE
DATA (1502)
READ BY PC MODE (1501)
THE SAME LSN (LOGICAL
SECTOR NUMBER) IS ALLOCATED
TO DIFFERENT PSN (PHISICAL
SECTOR NUMBER).
REPLACING SECTOR (406)

FIG.16

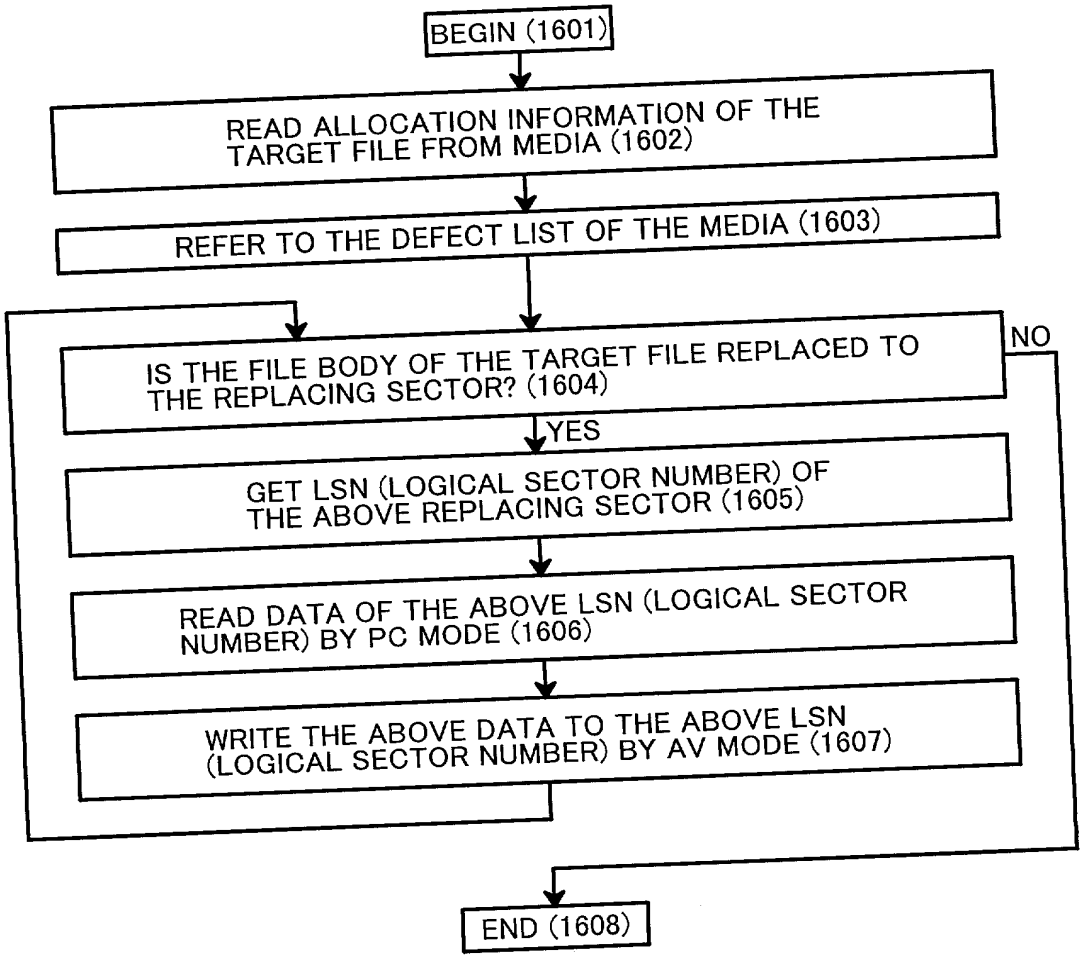

BEGIN (1601)
READ ALLOCATION INFORMATION OF THE
TARGET FILE FROM MEDIA (1602)
REFER TO THE DEFECT LIST OF THE MEDIA (1603)
IS THE FILE BODY OF THE TARGET FILE REPLACED TO
THE REPLACING SECTOR? (1604)
NO
YES
GET LSN (LOGICAL SECTOR NUMBER) OF
THE ABOVE REPLACING SECTOR (1605)
READ DATA OF THE ABOVE LSN (LOGICAL SECTOR
NUMBER) BY PC MODE (1606)
WRITE THE ABOVE DATA TO THE ABOVE LSN
(LOGICAL SECTOR NUMBER) BY AV MODE (1607)
END (1608)

FIG.17

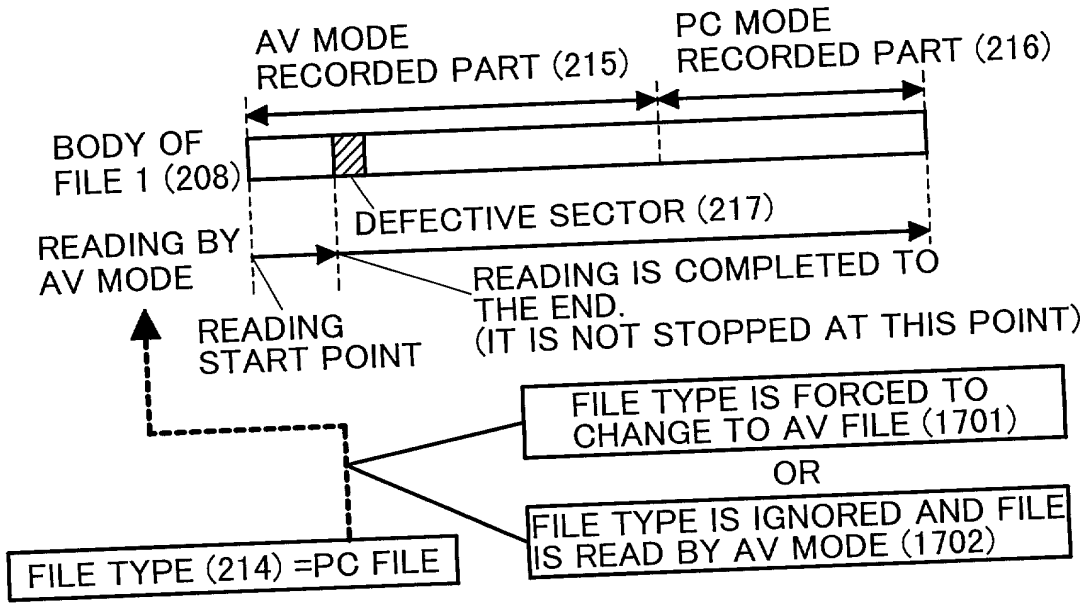

AV MODE
RECORDED PART (215)
PC MODE
RECORDED PART (216)
BODY OF
FILE 1 (208)
DEFECTIVE SECTOR (217)
READING BY
AV MODE
READING IS COMPLETED TO
THE END.
(IT IS NOT STOPPED AT THIS POINT)
READING
START POINT
FILE TYPE IS FORCED TO
CHANGE TO AV FILE (1701)
OR
FILE TYPE IS IGNORED AND FILE
IS READ BY AV MODE (1702)
FILE TYPE (214) =PC FILE

FIG.18

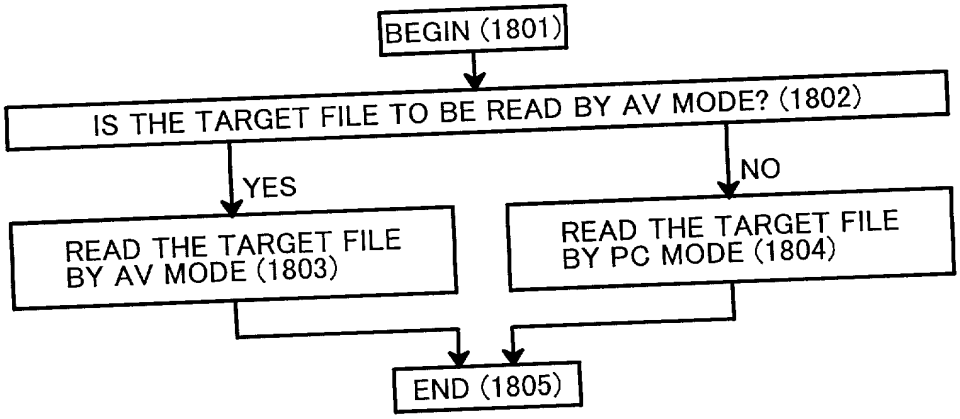
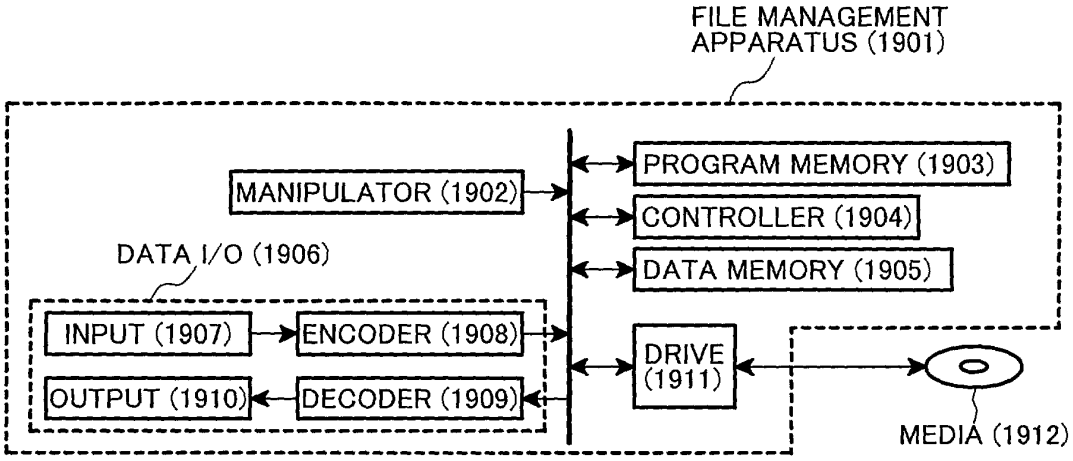

BEGIN (1801)
IS THE TARGET FILE TO BE READ BY AV MODE? (1802)
YES
NO
READ THE TARGET FILE
BY AV MODE (1803)
READ THE TARGET FILE
BY PC MODE (1804)
END (1805)

FIG.19


FILE MANAGEMENT APPARATUS (1901)
MANIPULATOR (1902)
PROGRAM MEMORY (1903)
CONTROLLER (1904)
DATA MEMORY (1905)
DATA I/O (1906)
INPUT (1907)
ENCODER (1908)
OUTPUT (1910)
DECODER (1909)
DRIVE (1911)
MEDIA (1912)